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I claim as my invention

~~Patent Claims~~

1. Method for calibrating an engraving amplifier in an electronic engraving machine for engraving printing cylinders, in which

a) an engraving signal (G) for actuating an engraving member (3) is acquired from engraving values (GD) representing desired tone values and a periodic vibration signal (R) in an engraving amplifier (8) that can be adjusted by signal values (R,G);

b) the engraving member (3) engraves cells into the printing cylinder, the actual dimensions of which cells represent engraved actual tone values;

c) transmission functions (f) are calculated, which reproduce the relations between variations, which are adjusted at the engraving amplifier (8), of the signal values (R, G) and the resulting variations of the geometric actual dimensions of the engraved cells;

d) signal values (R, G_L, G_T, G_M) for modifying at least one parameter "vibration", "light", "depth", or "medium gradation" are set at the engraving amplifier (8);

e) with the signal values (R, G_L, G_T, G_M), cells (33) are engraved for predetermined desired tone values, and their geometric actual dimensions are measured out;

f) difference values (ΔR, ΔG_L, ΔG_T, ΔG_M) are calculated from the actual dimensions and the desired dimensions of the cells (33) upon consideration of the transmission functions (f);

g) the signal values (R, G_L, G_T, G_M) are corrected by adding the difference values (ΔR, ΔG_L, ΔG_T, ΔG_M);

h) the sequences d) to g) are repeated using the corrected signal values (R, G_L, G_T, G_M), respectively, until the actual dimensions of the cells (33) are at least within a tolerance range about the desired dimensions, characterized in that to shorten the calibration time

i) in each sequence d) to g), the actual dimensions of the cells (33) are compared to the desired dimensions;

j) if the actual dimensions are outside the tolerance range, the transmission functions (f) are recalculated, and

k) the difference values (ΔR, ΔG_L, ΔG_T, ΔG_M) are computed upon consideration of the recalculated transmission functions (f'); and

l) the signal values (R,G_L, G_T, G_M) are corrected using the new difference values (ΔR, ΔG_L, ΔG_T, ΔG_M).

2. Method as claimed in claim 1, characterized in that the calculation of the new transmission functions (f') respectively occurs by difference formation between the adjusted signal values (R, G_L, G_T, G_M) and by difference formation between the functionally appertaining actual dimensions of the cells (33) of two successive sequences d) to g).

3. Method as claimed in claim 1 or 2 characterized in that the dimension of a cell (33) is the cross-diagonals (d_Q), the longitudinal diagonal (d_L) and potentially the penetration depth (d_K).

4. Method as claimed in at least one of the claims 1 to 3, characterized in that the difference value (ΔR) of the vibration signal value (R) for the parameter "vibration" is computed from the difference between the actual dimensions (d''_{QT}, d''_K) and the desired dimensions (d'_{QT}, d'_K) of a cell representing the tone value domain "depth".

5. Method as claimed in at least one of the claims 1 to 4, characterized in that

– a fictive cross-diagonal (d^*_{QL}) for a cell representing the tone value domain "light" [...] as the sum of the measured cross-diagonals (d''_{QL}) and a cross-diagonal variation ($\Delta d_{QL}(R)$) which arises owing to the variation (ΔR) of the vibration signal (R),

– the deviation (Δd_{QL}) of the fictive cross-diagonals (d^*_{QL}) from the desired cross-diagonals (d'_{QL}) is computed, and

– the difference value (ΔG_L) of the engraving signal value (G_L) for the parameter "light" is computed from the determined deviation (Δd_{QL}) and the transmission function [$f(G_L)$; $f'(G_L)$] which represents the relation between a variation of the engraving signal value (G_L) for the parameter "light" and the resulting variation of the cross-diagonals (d_{QL}) of a cell (33) representing the tone value domain "light".

6. Method as claimed in at least one of the claims 1 to 5, characterized in that
– a fictive cross-diagonal (d^*_{QT}) for a cell representing the tone value domain "depth" [...] as sum of the measured cross-diagonals (d''_{QT}) and a cross-diagonal variation ($\Delta d_{QT}(R)$) that occurs owing to the variation (ΔR) of the vibration signal (R),
– the deviation (Δd_{QT}) of the fictive cross-diagonals (d^*_{QT}) from the desired cross-diagonals (d'_{QT}) is determined, and
– the difference value (ΔG_T) of the engraving signal value (G_T) for the parameter "depth" is computed from the determined deviation (Δd_{QT}) and the transmission function [$f(G_T)$; $f'(G_T)$], which reproduces the relation between a variation of the engraving signal value (G_T) for the parameter "depth" and the resulting variation of the cross-diagonals (d_{QT}) of a cell (33) representing the tone value domain "depth".

7. Method as claimed in at least one of the claims 1 to 6, characterized in that
– a fictive cross-diagonal (d^*_{QM}) for a cell representing the tone value domain "medium gradation" [...] as sum of the measured cross-diagonals (d''_{QM}) and cross-diagonal variations ($\Delta d_{QM}(R)$; $\Delta d_{QM}(G_L)$ $\Delta d_{QM}(G_T)$) that occur owing to the variation (ΔR) of the vibration signal (R),
– the deviation (Δd_{QM}) of the fictive cross-diagonals (d^*_{QM}) from the desired cross-diagonals (d'_{QM}) is determined, and
– the difference value (ΔG_M) of the engraving signal value (G_M) for the parameter "medium gradation" is computed from the determined deviation (Δd_{QM}) and the transmission function [$f(G_M)$ $f'(G_M)$], which reproduces the relation between a

variation of the engraving signal value (G_M) for the parameter "medium gradation" and the resulting variation of the cross-diagonals (d_{QM}) of a cell (33) representing the tone value domain "medium gradation".

8. Method as claimed in at least one of the claims 1 to 7, characterized in that
– the relations between signal values (R, G_L, G_T, G_M) and the actual measurements of the engraved cells (33) are approximately linear, and
– the relations are defined by transmission coefficients (f; f′)

9. Method as claimed in at least one of the claims 1 to 8, characterized in that the signal values (R, G_L, G_T, G_M) that are set for the first sequence d) to g) are experimental values.